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| | | | EXAMINER LAIOS, MARIA J | |
| | | | ART UNIT 1795 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/523,093

Applicant(s)

IRVINE ET AL.

Examiner

Maria J. Laios

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) 15-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 20-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 February 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>11 April 2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's election without traverse of Group I, comprising of claims 1-14, and 20-22, in reply filed on November 6, 2007 is acknowledged.

2. Claims 15-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group II, there being no allowable generic or linking claim.

Election was made **without** traverse in the reply filed on November 6, 2007.

Drawings

2. The drawings are objected to because there should not be a description next to figure numbers. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Interpretation

3. In claims 1-12, 14, 22, it is noted a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). In claims 1 and 14, the intended use of a solid oxide fuel cell is not given patentable weight.

Claim Objections

4. Claims 11 and 12 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. As discussed on page 7 of the instant application, it is the electrode with this porosity and not the material.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 20 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described

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in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The methods claimed in claims 20 and 21 apply a voltage to oxidize the fuel. In a conventional SOFC, hydrocarbon fuel is oxidized to produce the electricity. Therefore it is unclear how applying electricity to a SOFC oxidizes a hydrocarbon fuel.

7. Claims 11 and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. On page 7 lines 20-26 of the instant application, the electrode is described as having porosity and not the material in itself.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-4, 7, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Seto et al. (EP 0 411 547 A1).

With regard to claim 1, Seto et al. discloses a general formula compound of $\text{La}_{1-x}\text{M}_x\text{Cr}_{1-y}\text{M}'_y\text{O}_3$ where M is at least one alkaline earth metal other than magnesium, M' is at least one metal

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selected from the group of Mn or Fe and x is from 0 to 0.5 and y is from 0 to 0.5 having a perovskite structure (page 3 lines 42-45) which fulfills the general formula of applicant which is $(\text{Ln}_a\text{X}_b)_e(\text{Z}^1\text{Z}^2_d)_f\text{O}_g$, where Ln is La, X is Sr, and Z^1 and Z^2 are selected from Cr, Mn or Fe, and where a is from 0.5 to 1, b is from 0 to 0.5, c is from 0.25 to 0.5, d is from 0.25 to 0.5, e is 1, f is 1, g is 3 and a+b and c+d equal 1.

With regard to claim 2, Seto et al discloses Cr and Mn as Z^1 and Z^2 (page 3 lines 42-45).

With regard to claim 3, Seto et al discloses M as an alkaline earth metal other than magnesium therefore Sr can be chosen (page 3 lines 42-45).

With regard to claim 4, Seto et al. discloses partially replacing the Cr of the B site with a metal chosen from Co, Fe, Ni, Cu or Pd (Page 4 line 7).

With regard to claim 7, Seto et al. discloses when y is 0.5 then c and d are both 0.5 (page 3 lines 42-45).

With regard to claim 13, Seto et al. discloses the perovskite material for use as a separator/interconnector (4) which is in contact with the anode (3) which can be regarded as a functional layer of an anode (Figure 1).

10. Claims 1 and 3 are rejected under 35 U.S.C. 102(a) as being anticipated by Mikkelsen et al. (Oxygen transport in $\text{La}_{1-x}\text{Sr}_x\text{Fe}_{1-y}\text{Mn}_y\text{O}_{3-\delta}$ perovskites, available online September 2002).

With regard to claims 1 and 3, Mikkelsen et al. discloses $\text{La}_{0.5}\text{Sr}_{0.5}\text{Fe}_{0.7}\text{Mn}_{0.3}\text{O}_{3-\delta}$ which reads on the claimed general formula of $(\text{Ln}_a\text{X}_b)_e(\text{Z}^1\text{Z}^2_d)_f\text{O}_g$ where Ln is La, X is Sr, Z^1 is Fe and Z^2 is

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Mn, a is 0.5, b is 0.5, c is 0.7, d is 0.3, e is 1, f is 1 and g is 3- δ (Page 704 col. 2, Results and Discussion section).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 5, 6, 8-10 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seto et al (EP 0 411 547 A1).

The discussion of Seto as discussed above is incorporated herein.

With respect to claims 5 and 6, Seto discloses the total amount of the dopant replacing Cr is up to 0.5 molar fraction, preferably 0.05-0.3 molar fraction (Page 4, lines 5-12) which reads on 5-30 percent and overlaps the claimed range of 5 to 20 percent. Fe disclosed in Seto can be regarded as the B-site dopant.

With regard to claims 9 and 10, Seto et al. discloses x with a range of 0 to 0.5, thereby having a value of 0.5 to 1 for a. (Page 3 lines 42-45).

With regard to claim 22, Seto et al. discloses the value of x as $0 < x \leq 0.5$ (page 3 lines 42-45) which means $0.5 \leq b < 1$.

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In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990)

With respect to claim 8, Seto discloses M' is at least one metal (Abstract) and in the $\text{La}_{1-x}\text{M}_x\text{Cr}_{1-y}\text{M}'_y\text{O}_3$, Cr_{1-y} , any element M' can be considered a B-site dopant. When y is 0.5, Cr can be considered the third element occupying 50 percent of the B site and the rest of the B-site can be occupied by two metals selected from Mn and Fe. Mere fact that reference suggests multitude of possible combinations does not in and of itself make any one of those combinations less obvious That specific embodiment is not taught as preferred makes it no less obvious Merck v. Biocraft, 10 USPQ2d 1843 (Fed. Cir. 1989)

13. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mikkelsen et al. (Oxygen transport in $\text{La}_{1-x}\text{Sr}_x\text{Fe}_{1-y}\text{Mn}_y\text{O}_{3-\delta}$ perovskites, available online September 2002).

The disclosure of Mikkelsen as discussed above is incorporated herein

With respect to claim 9, a can be 0.5-1 which overlaps the claimed value of 0.7-0.9 (See figure 1). In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (page 3 lines 42-45).

14. Claims 1 and 11-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuo (US 5,686,198) in view of Seto et al (EP 0 411 547 A1).

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With respect to claim 1, Kuo discloses a double perovskite oxide material with the general formula of $(La_{1-w-x-y}Ln_wCe_x(M_A)_y)(Mn_{1-z}(M_B)_z)O_3$, where Ln is a Lanthanide mixture, M_A is an A-site dopant of Sr, Ca, or Ba, M_B is a site dopant of Mg, Fe, or Cr, w is from about 0.05-0.9, x is from about 0 to 0.1, y is about 0.1-0.2 and z is about 0.05-0.1 (col. 6 lines 30-50). This fulfills the claimed general equation of $(Ln_aX_b)_e(Z^1_cZ^2_d)_fO_g$ when Ln is a Lanthanide mixture, M_A is an A-site dopant of Sr, Ca, or Ba, M_B is a site dopant of Mg, Fe, or Cr; g is equal to 3; e and f are equal to 1; the stoichiometries of the A-site are equal to 1 (1-w-x-y), and the stoichiometry of the B-site values is equal to 1 (1-z, applicant states that c + d has a value of 1) but fails to teach the B-site values for c and d between 0.25 and 0.75.

Seto teaches a double perovskite material for use in a fuel cell with the B site values (Cr is up to 0.5, which would fulfill the B-site requirements of c, d when the molar fraction of Cr is between 0.25-0.5) in order to improve the electrical conductivity of the complex oxide (Page 4 lines 9-10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the B site molar fraction values of Kuo with those of Seto because this would improve the electrical conductivity of the complex oxide.

With respect to claim 11, Kuo teaches the porosity of 20-24 percent (col. 6 line 22).

With respect to claim 12, in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

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With respect to claim 14, Kuo teaches the material as a cathode (Abstract) but may function as anode since the material is the same. It is noted a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). In claim 14, the intended use of an anode for use in a SOFC is not given patentable weight.

Conclusion

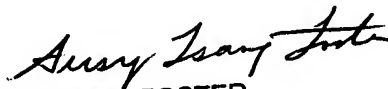
15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria J. Laios whose telephone number is 571-272-9808. The examiner can normally be reached on Monday - Thursday 9:30 - 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJL


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SUPERVISORY PATENT EXAMINER